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Detection of stress concentration regions in cyclic loading by the heat monitoring method

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Abstract

We present a method for determining stress concentration regions in structures under multiply repeated cyclic loads. To determine the stress concentration regions, we propose to stabilize the structure temperature characteristics before the cyclic loading and then, in the process of cyclic loading, measure the structure temperature field by thermal imaging equipment with subsequent analysis and processing of the obtained thermograms. The stress concentrations regions in the structures correspond to anomalous regions of thermograms, where the temperature excess is more than 0.3° C, and hence the stress concentration regions are clearly seen in the thermograms. © Allerton Press, Inc., 2010.

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Keywords

Cyclic loading, Heat monitoring, Stress concentration, Thermogram